

PUTTING ELECTRIC BICYCLES TO THE TEST

Over the past five years, the electric bicycle market has exploded. While today dozens of brands exist, they more or less offer the same features.

Jean-François Urwyler, professor, Biel/Bienne engineering school: What you find in an electric bike of course is a battery. The battery is to the bike what the gas tank is to a car, that's where the fuel, the energy is stocked. You also have an electrical motor, it can be attached in the back or in the front wheel or be just above the pedals, in the middle of the machine.

Then there's the control system as well as an display that will give you various indications such as the battery charge, your speed etc.

The bikes were subjected to a test developed by the Biel/Bienne Engineering School to reproduce real-world conditions.

An external motor simulated the cyclist's pedaling.

Eighty kilograms was divided between both wheels to replace the cyclist's weight. This set-up was placed on rollers reproducing a slope of 6 percent.

We tested 13 bikes from both specialized shops and supermarkets. All models offered assistance up to 25 kilometers per hour. We did not test the fast 45 kilometer per hour bikes because they are little used.

The engineering school evaluated three aspects of electric bicycles: motor power, in other words the effectiveness of the pedaling assistance.

The second criterion was battery autonomy. Finally, the quality of the bike's materials (like the frame, brakes, etc.) was evaluated by *Vélo* magazine.

Here are the test results, from the worst to the best bike, rated from one to six:

- 1) We start off with the worst bike. Landi's Xtrabike is one of the two cheapest bikes tested, with a list price of 1,390 Swiss francs. Not a single technical parameter satisfied the experts. Rated 3.6 out of 6.
- 2) The same goes for the E-Racer by Athléticum, which is just below average with a score of 3.9.
- 3) The Crosswave by Migros, one of the lightest at 23 kilograms, benefits from correct pedaling assistance. Score: 4.3.
- 4) The laboratory was unimpressed by the Villiger's motor power, even though this bike costs 3,799 francs. Ill-suited to hilly routes. However, resistant materials. Score: 4.4.
- 5) Ditto for the Koga, one of the most expensive bikes tested, at 3,999 francs. The lab judged its battery autonomy insufficient. Not a good choice for long rides. Score: 4.5.

6) Close behind was Jumbo's California, with a score of 4.6.

7) The Raleigh scored a little better, with the best battery autonomy of any bike tested. Weak point--its motor power. Score: 4.7.

8) Excellent value for money was the Léopard by Coop. One of the lightest bikes, excellent autonomy, but merits better quality components. Score: 4.8.

9) Same score for the Stromer, the most expensive bike at 4,490 francs. Average battery autonomy and assistance. It owes its good technical score to the quality of its materials. Score: 4.8.

10) Ditto for the Weeller, with a good score of 4.8.

11) Three bikes obtained a score of 5 or more. The Flyer is technically speaking well-balanced. Surprise, this bike has the same motor as the less well judged Raleigh. Flyer's score: 5.

Jean-François Urwyler, engineer: If you take the Flyer, they chose to mount it with a powerful engine at the detriment of its range. So, whereas the Raleigh, probably meant for flat countries has a weaker engine but a longer range. Typically, between a Flyer and a Raleigh, a Flyer is better adapted to Switzerland.

12) The Cresta has just average battery autonomy, but excellent motor power. Perfect for very hilly cities. Score: 5.

13) The best technical score was obtained by the Watts model. Excellent motor and battery autonomy. Interesting price in this top trio: 2,990 francs. Score of 5.2.

Outside the laboratory, all of these bikes were road tested by a panel of 100 cyclists with varied profiles. Among them, retirees, athletes, women and men.

The top five technical bikes also received excellent user ratings.

It should be noted that three bikes that received average technical scores in the lab were very well rated by their users.

So, how to make the right choice? To find the bike that's right for you, seek advice from a specialist and test ride before deciding. We visited Vincent Ebiner's shop, a leading retailer of electric bikes in French-speaking Switzerland, offering a wide selection of brands and covering the three top types of motorization.

Vincent Ebiner: There are several types of ebikes. This type has an engine in the middle, above the pedals and the gear is in the wheel hub. Now, this allows you to stop, and to a change gear even without riding. Now imagine, you stop at a red light, without slowing down or downshifting gear and you can start again in first gear. It's like in a car, on a steep hill. You can't start in third so you can shift to first...

Now with this one, the engine's in the rear hub and the advantage is that you can have a number of different gearing options. Lots of people enjoy riding their traditional bikes and they like the advantage of having different gears to play with.

So on this type of bikes, you have to be used to changing gear and all that ?

Vincent Ebner: Yes , exactly, if you already must get used to the electrical components of your bike, and on top of it you have to deal with all those gears. It can be a bit much...

Now the trouble with these bikes is you can't have a very powerful engine since it's attached on the front wheel fork. You see, in the rear you have a whole system of stays to ensure the motor's stable. So if you have a motor in front, that can cause problems.

So not the right kind of bikes for Lausanne or Fribourg, for hilly cities?

Vincent Ebner: No but for Geneva for instance, it's a real pleasure.

To sum up, a good electric bike must meet your needs and expectations, but three criteria should be taken into account--the duration of your outings, the hilliness of your routes, and your own bicycling ability.